PSYCHE

A JOURNAL OF ENTOMOLOGY

Established in 1874

Vol. 55 SEPTEMBER, 1948 No. 3

CAMBRIDGE ENTOMOLOGICAL CLUB 1874

TABLE OF CONTENTS

The Genus *Pachodynerus* (Hymenoptera, Vespidæ) in the Antilles. *J. C. Bequaert* 105
Pupal Parasites of Tabanidæ. *N. S. Bailey* 112
Notes on Perlidæ. *N. Banks* 113
Notes on *Tabanus atratus* subsp. *nantuckensis* Hine (Diptera). *N. S. Bailey* 131
The Generic Name *Trombiculoides* Jacot, 1938. *G. W. Wharton* 139
Seven New Flea Beetles from the West Indies (Coleoptera-Chrysomelidæ). *D. H. Blake* 141

CAMBRIDGE ENTOMOLOGICAL CLUB

OFFICERS FOR 1947–48

President	N. S. BAILEY
Vice President	W. L. BROWN, JR.
Secretary	F. WERNER
Treasurer	F. M. CARPENTER
Executive Committee	B. I. GERRY P. J. DARLINGTON, JR.

EDITORIAL BOARD OF PSYCHE

F. M. CARPENTER—EDITOR
C. T. BRUES
P. J. DARLINGTON, JR.
J. BEQUAERT

PSYCHE is published quarterly, the issues appearing in March, June, September, and December. Subscription price, per year, payable in advance: $3.00 to Subscribers in the United States; Canadian and foreign subscriptions $3.25, payable at par. Single copies, 85 cents.

Cheques and remittances should be addressed to Treasurer, Cambridge Entomological Club, Biological Laboratories, Harvard University, Cambridge, Mass.

Orders for back volumes, missing numbers, notices of change of address, etc., should be sent to the Editorial Office of Psyche, Biological Laboratories, Harvard University, Cambridge, Mass.

IMPORTANT NOTICE TO CONTRIBUTORS

Manuscripts intended for publication, books intended for review, and other editorial matter, should be addressed to Professor F. M. Carpenter, Biological Laboratories, Harvard University, Cambridge, Mass.

Authors contributing articles over 8 printed pages in length will be required to bear a part of the extra expense, for additional pages. This expense will be that of typesetting only, which is about $2.75 per page. The actual cost of preparing cuts for all illustrations must be borne by contributors; the expense for full page plates from line drawings is approximately $5.00 each, and for full page half-tones, $7.50 each; smaller sizes in proportion.

AUTHOR'S SEPARATES

Reprints of articles may be secured by authors, if they are ordered before, or at the time proofs are received for corrections. The cost of these will be furnished by the Editor on application.

The June, 1948, PSYCHE (Vol. 55, No. 2) was mailed October 25, 1948.

BUSINESS PRESS, INC., LANCASTER, PA.

PSYCHE

VOL. 55 SEPTEMBER, 1948 No. 3

THE GENUS *PACHODYNERUS* (HYMENOPTERA, VESPIDÆ) IN THE ANTILLES[1]

BY JOSEPH C. BEQUAERT

Museum of Comparative Zoölogy, Cambridge, Mass.

The key to the Antillean species of *Pachodynerus* and the appended brief notes on their synonymy and distribution are extracted from a large manuscript covering the vespid fauna of these islands. They will help to clarify the affinities of a new Cuban species recently received from Dr. S. C. Bruner, who kindly presented the types to the Museum of Comparative Zoölogy.

1. Thorax very short and high, nearly cubical, scarcely longer than wide. Postscutellum crossed by a sharp, finely crenulate ridge. Superior ridge of propodeum with a complete, high, translucent lamella. Edge of first abdominal tergite evenly rounded in profile, not bluntly angular, with minute, scattered punctures. Ocellar area more or less grooved. Clypeus of male with a median pair of low longitudinal humps. Black, with pale brownish-yellow markings; abdomen dull, with appressed short hairs; head and thorax with longer, somewhat silky pubescence .... *P. nasidens.*

   Thorax either markedly longer than wide or (in *alayoi*) superior ridge of propodeum incomplete, not lamellar. Black with bright yellow markings, sometimes partly ferruginous-red. Body dull or more or less shiny, without appressed short hairs and without silky pubescence .... 2.

---

[1] Published with a grant from the Museum of Comparative Zoölogy at Harvard College.

2. Edge of first abdominal tergite bluntly angular and slightly swollen at the junction of basal slope and apical horizontal area, the latter with coarse punctures. Superior ridge of propodeum with a complete lamella; concavity with strong transverse striæ and coarse punctures. Interocellar area slightly grooved. Clypeus of male with medium-sized punctures and a median pair of low longitudinal humps. Inner margin of mandible of male with the basal tooth low and broad. Black; head and thorax with many yellow markings; tergites 1 and 2 and sternite 2 with apical yellow bands; legs mostly ferruginous-red .... *P. jamaicensis.*

   Apical horizontal area of first abdominal tergite minutely punctate. Concavity of propodeum either mostly smooth or finely transversely striate .... 3.

3. Superior ridge of propodeum low and irregular, not forming a complete lamella. Thorax only very slightly longer than wide. Edge of first abdominal tergite not angular, evenly rounded at the junction of basal slope and apical horizontal area. Interocellar area grooved. Clypeus of male with medium-sized punctures, without median longitudinal humps. Inner margin of mandible of male with the basal tooth low and broad. Black; head, thorax and legs profusely marked with yellow; tergites 1 and 2 and sternite 2 with apical yellow bands. .... *P. alayoi.*

   Superior ridge of propodeum with a complete, high sometimes translucent lamella. Thorax distinctly longer than wide .... 4.

4. Edge of first abdominal tergite not angular, evenly rounded at the junction of basal slope and apical horizontal area. Interocellar area slightly grooved. Clypeus of male with minute sculpture and a median pair of low longitudinal humps. Inner margin of mandible of male with the basal tooth high, triangular. Black; head, thorax and legs profusely marked with yellow; abdomen with apical bands and sometimes (var. *sancti-vincenti*) with lateral spots on tergite two .... *P. guadulpensis.*

Edge of first abdominal tergite bluntly angular and often slightly swollen at the junction of basal slope and apical horizontal area .... 5.

5. Interocellar area flat or scarcely depressed. Clypeus of female coarsely punctate; of male slightly longer than wide, with medium-sized punctures, without median longitudinal humps. Inner margin of mandible of male with the basal tooth low and broad. Black; head, thorax and legs profusely marked with yellow; tergites 1 and 2 and sternite 2 with apical yellow bands (also two discal spots on tergite 2 in var. *barbouri*) .... *P. tibialis.*

Interocellar area distinctly grooved. Clypeus of female with medium-sized punctures; of male about as long as wide, with medium-sized punctures and a median pair of low longitudinal humps. Inner margin of mandible of male with the basal tooth high, triangular .... 6.

6. Sculpture of head and thorax very coarse; pronotum, scutellum and postscutellum almost rugoso-reticulate. Cheeks rather swollen in profile, at least half as wide as the eye at the occiput. Colored much like *P. cubensis* in typical form, but the apical abdominal segments often less extensively ferruginous or entirely black; in var. *bahamensis,* base of first abdominal tergite extensively ferruginous-red. *P. scrupeus.*

Sculpture of head and thorax dense, but moderately coarse, not rugoso-reticulate. Cheeks barely swollen in profile, less than half as wide as the eye at the occiput. Black; head and thorax profusely marked with yellow; tergites 1 and 2 and sternite 2 with apical yellow bands (much widened at the sides of tergite 1); base of flagellum, femora and apical segments of abdomen more or less extensively ferruginous-red .... *P. cubensis.*

1. *Pachodynerus nasidens* (Latreille, 1817). *Odynerus simplicicornis* de Saussure (1855), described from Cuba, I regard as a synonym, being unable to find any consistent difference between Cuban and continental American speci-

mens. The wasps recorded as *O. brachygaster* from Cuba, by H. Lucas and Gundlach, were also *P. nasidens.* I have never seen the true *P. brachygaster* (de Saussure, 1853) from any of the Antilles. *P. nasidens* is widely distributed throughout most of Central and South America and is at present spreading outside the New World. It is common in Cuba, Hispaniola, Jamaica and Puerto Rico. In the Bahamas it has only been taken thus far in New Providence. I have seen a specimen labelled Miami, Florida, no doubt an accidental introduction. Whether *Pachodynerus acuticarinatus* (Cameron), of Texas and Arizona, and *P. pulverulentus* (Viereck), of Arizona and Southern California, are specifically or racially distinct from *P. nasidens* is as yet undecided.

2. *Pachodynerus jamaicensis* Bequaert and Salt, 1931. This species is restricted to Jamaica. It includes the wasps recorded from there by Fox, Ashmead, and Gowdey as *O. tibialis,* and by Gowdey as *O. guadulpensis,* two species I have never seen from Jamaica.

3*a*. *Pachodynerus guadulpensis* (de Saussure, 1853), typical form. Originally described from Guadeloupe, this form of the species is found in most of the Lesser Antilles. I have seen it from Antigua, Montserrat, Dominica, Martinique, St. Lucia, the Grenadines (Canouan I.), Grenada, and Barbados. Published records from Jamaica and Trinidad were based on misidentifications. *Odynerus guadelupensis* Dalla Torre (1904) is an emendation of *O. guadulpensis.* According to the types, at British Museum and U. S. National Museum, *Odynerus grenadensis* Ashmead (1900) is not separable from *guadulpensis;* the structural characters are the same, while the apical bands are not actually absent on the tergites behind the second, as implied in the original description, but are dirty orange or ferruginous, instead of yellow, evidently an artificial discoloration. Similar discoloration may be seen in some specimens from the other islands. The dorsal face of the pronotum is sometimes wholly yellow, as stressed by de Saussure; more often it bears on each side a small discal, triangular black spot.

3*b*. *Pachodynerus guadulpensis* var. *sancti-vincenti*

(Ashmead, 1900). I have seen the types of *Odynerus sancti-vincenti* at the British Museum and at the U. S. National Museum, as well as two additional females collected in St. Vincent by J. Ogilvie. Structurally these wasps agree with *P. guadulpensis* from the other Lesser Antilles, but they are more abundantly marked with yellow. The apical band of the first tergite extends along the sides and often projects somewhat inward along the edge of the slope. Usually also there is a free discal yellow spot on each side of tergite two. In some of the types these spots are very small or barely indicated. I have not seen them in any *guadulpensis* from any of the other Antilles. So far as known at present var. *sancti-vincenti* is peculiar to St. Vincent.

4*a*. *Pachodynerus tibialis* (de Saussure, 1853), typical form. So far as known, this form is restricted to Hispaniola and the neighboring Mona Island. It is black, with fairly numerous yellow markings on head, thorax and legs; but clypeus, mesopleura and propodeum are mostly black; tergites 1 and 2 and sternite 2 have a broad yellow margin, but there are no yellow discal spots.

4*b*. **Pachodynerus tibialis** var. (or subsp.) **barbouri**, new.

Female.—Black, with the following parts yellow: entire clypeus; narrow margin of lower inner orbits; streak along upper outer orbits; small interantennal spot; basal spot on mandible; scape beneath; much of dorsal area of pronotum; most of mesopleura, tegulæ and propodeum (broad center of concavity black); postscutellum; broad apical margins of tergites 1 and 2 and sternite 2; that of tergite 1 abruptly widened and extending somewhat mesad along the edge of the slope; that of sternite 2 extensively widened on the sides; a spot on each side of tergite 2 narrowly divided from the yellow margin; most of coxæ; apical portion of fore and mid femora; apical spot on hind femora; tibiæ except for a narrow inner black streak. Structurally like the typical form, except that the lamellar superior ridge of the propodeum is not straight but wavy, forming a broad upward curve midway between the lateral angle and the postscutellum. If this peculiarity is found consistently in other Bahaman specimens, *barbouri* may have to be raised to specific rank. The unknown male may furnish additional characters.

Bahamas: Great Inagua, female holotype, February 26, 1934 (Utowana Expedition.—M. C. Z. No. 27832).

Named for the late Dr. Thomas Barbour, in appreciation of his lifelong interest in the Antillean fauna.

5. **Pachodynerus alayoi**, new species.

Male.—Similar to *P. guadulpensis* and *P. tibialis*, except for the following. Interocellar area deeply grooved, with longitudinal swellings near the posterior ocelli; the latter slightly farther apart than their distance from the eyes. Ridge between antennæ low, not carinate. Clypeus slightly higher than wide, relatively narrower in upper area than in *tibialis*, the inner orbits being slightly over one and one-half times as far apart on the vertex than at the narrowest of the clypeus; surface barely convex, without median longitudinal humps; lower free portion much shorter than upper interocular part; truncate apex relatively narrower than in *tibialis*, less than one-third of the greatest width of the clypeus. Mandible as in *tibialis*, the inner margin with the basal tooth low and broad. Thorax seen from above scarcely longer than greatest width, relatively shorter than in *tibialis*. Propodeum: superior ridge poorly developed, except close to the lateral angle where there is a short, low carina; elsewhere the coarse sculpture of the dorsal areas extends beyond the ridge onto part of the concavity as medium-sized punctures; lateral angle low, blunt. First abdominal tergite not in the least angular at the junction of basal slope and horizontal apical area, as evenly rounded off as in *guadulpensis*.

Head and thorax very coarsely punctate, almost rugoso-reticulate, much as in *jamaicensis;* but concavity of propodeum mostly smooth, with a median area of a few, weak transverse striæ. Clypeus with scattered medium-sized punctures, about as in *tibialis* and *jamaicensis*. Sculpture of abdomen as in *tibialis*.

Black, without ferruginous, with the following areas yellow: clypeus; most of lower half of face; a broad streak along upper outer orbits; a large basal spot on mandible; scape, except for a black streak above; broad humeral margin of pronotum (including carina); two spots on scutellum; most of postscutellum; a large spot on upper mesepisternum; most of dorsal areas of propodeum, the yellow continued over the sides close to the lateral angles; most of tegulæ; legs except for coxæ and part of femora, the tarsi darker, more or less ferruginous; and broad apical margins on tergites 1 and 2 and on sternite 2, not abruptly widened at the sides. Wings as in *tibialis*.

Length (h. + th. + t.1 + 2), 7 mm.; of fore wing, 6 mm.

Female.—Except for the usual sexual differences, like the male in structural characters and color markings. Clypeus about as high as wide, the inner orbits about one and one-third times as far apart on the vertex as the narrowest of the clypeus; lower free portion about as long as upper interocular part; surface coarsely and densely punctate. Clypeus yellow, with a narrow median black streak over apical half.

Length (h. + th. + t.1 + 2), 8 mm.; of fore wing, 7 mm.

The absence of a complete lamellar ridge between the dorsal areas and the concavity of the propodeum is unusual in *Pachodynerus*. It differentiates *P. alayoi* not only from all other Antillean species, but also from most of those found elsewhere, except *P. peruensis* (de Saussure).

Cuba: Siboney near Santiago de Cuba, male holotype, May 5, 1940 (M.C.Z. No. 27829); Ciudamar near Santiago de Cuba, female allotype, January 18, 1948; both collected by Mr. Pastor Alayo.

6. *Pachodynerus cubensis* (de Saussure, 1853). Known only from Cuba, where it seems to occur everywhere, being one of the characteristic elements of the fauna.

7*a*. *Pachodynerus scrupeus* (Zavattari, 1912), typical form. Found in Cuba, where it appears to be rare (Preston and Banes, in Oriente; Santiago de las Vegas), and more commonly in the Bahamas (Cat I.; New Providence; Rum Cay; Eleuthera). Most of the Cuban specimens are colored much like *P. cubensis;* but the yellow markings are somewhat more extensive, while the ferruginous color covers more of the flagellum. In some Cuban specimens the apical abdominal segments are as extensively ferruginous-red as in *cubensis;* in the Bahaman specimens they are almost wholly black. One Cuban specimen, however, is in this respect like those of the Bahamas, so that the Bahaman wasps without reddish on the base of the first tergite do not seem to be racially distinct from the Cuban ones.

7b. Pachodynerus scrupeus var. *bahamensis* Bequaert and Salt, 1931. This form differs from typical *scrupeus* in the first tergite of the abdomen being tricolored, broadly red at base (to beyond the angular edge), narrowly black in the middle, and banded with yellow at apex. The terminal segments of the abdomen are black in all specimens seen. Known only from the Bahamas: New Providence; Andros I. (Andros Cay); Long I. (Clarencetown); Watling I.; Rum Cay.

Male (undescribed).—Similar in color to the female, except that the clypeus is entirely yellow. Structurally it agrees with the male of typical *scrupeus.*

Allotype from New Providence, Bahamas, May 1, 1932 (J. G. Myers). Both holotype and allotype at M.C.Z. (No. 27832).

PUPAL PARASITES OF TABANIDÆ.—To complete the record the following references should be appended to my note on the pupal parasites of the Tabanidæ (Bailey, 1947). The chalcid *Diglochis occidentalis* Ashmead, of the Pteromalidæ, was reported as a parasite of three species of *Chrysops,* namely *C. excitans, C. mitis* and *C. moerens,* by Cameron (1926) and Philip (1931) found four pupæ of *C. mitis* parasitized by this species in Minnesota. These were previously overlooked. References: Bailey, N. S., 1947, Psyche, 54(2): 142; Cameron, A. E., 1926, Bull. Ent. Res., 17(1): 39–40; Philip, C. B., 1931, Minn. Agric. Exper. Station Tech. Bull., 80: 68.—N.S. BAILEY, Biological Laboratories, Harvard University.

NOTES ON PERLIDÆ[1]

By Nathan Banks
Holliston, Mass.

1. Perlesta

The species of *Perlesta* are of moderate size; they have three ocelli; the antennæ have basal joints as long as broad, with many fine appressed hairs, each joint with one or more longer erect hairs (sense hairs). The femora have not only fine hairs below but also longer bristles scattered among the hairs (most noticeable on the front femora). In the fore wings the anal cell at base of wings gives rise on the lower edge to a recurrent vein (the anal brace), the anal lobe is small, but, with the wings spread, readily seen, and the outer part of the anal brace crosses it; in the hind wings there are usually several cross-veins in the cubital area, but sometimes only one besides the end cross-vein and rarely only the end cross-vein; there are no cross-veins in apical part of wings, except in costal area. The setae are rarely as long as the abdomen, with many stout hairs, and near tip of each joint one or two much longer erect hairs, often as long as the joint, the first few joints are hardly longer than broad, but soon the joints are extremely long. The last joint of maxillary palpi is usually hardly one-half of the third joint. The V-mark is two slightly diverging arms, quite broad throughout and reaching about half way to the front margin. The genotype is *Perla placida* Hag.

Perlesta placida Hag. is common at and near Washington, and is found generally from Canada to Louisiana, east of the Appalachian Mountains, except in New England. Normally it has a pale yellowish head, with a shining black spot covering the ocelli, but not extending to the front of head; the pronotum is brown to yellowish brown, sometimes with a pale median stripe; the thorax, abdomen and legs are yellowish; the wings are clear, the veins pale or

---

[1] Published with a grant from the Museum of Comparative Zoölogy at Harvard College.

pale brown. Specimens with only a black bar connecting the hind ocelli were described by me as *P. virginica;* it is only a color form. Specimens without any black on head were named *P. immaculata* by Klapalek, this also is a color form. All of these have the genital prongs in the male very slender, usually near each other and each curved outward toward tip; the subgenital plate shows two lobes with truncate tips.

In 1862 Walsh described two species from Rock Island, Illinois; he put each in a separate subgenus, since one had but one branch to radial sector and the other had two branches. *P. decipiens* and *P. brunneipennis* usually have the black spot covering the ocelli, *decipiens* has clear wings, *brunneipennis* has infuscated wings. The genital prongs are very similar but quite different from *P. placida,* being much stouter and bent near the middle.

I consider that these two forms represent but one species, *P. decipiens.* It is the common form in the mid-west from Michigan to northern Texas. However there is a black species in this area, much less common, this is *Perlesta cinctipes* Bks. The body and wings are almost wholly black, the edge of the clypeus usually whitish, the legs are pale beneath, the setae are pale, but each joint has a dark band at tip, the hind femora are pale at base and tip, and at tip of hind tibiæ. The legs of this species are shorter and much less slender than in the other species, particularly noticeable in the hind femora. The pale of costal margin is reduced, each end of costal area being dark. In the female the subgenital lobes are large and the tips plainly rounded. In the male the genital prongs are very slender and longer than in *placida*, not, or scarcely outcurved at tips.

In 1914 I described another species, *P. texana* from Texas (Dallas, Kerrville, Victoria, Devil's River). It is yellowish to rufous, the ocelli faintly connected by a dark V-mark; legs are pale below with a brown streak above, the hind tibiæ dark except near tip; hind femur fairly slender; sides of ocellar triangle longer than base. In the male the genital prongs are moderately slender, slightly outcurved toward tip, and their bases separated by a basal width. In female the prongs are extremely broad at base, and with a short point, or slender peg at inner corner. Each lobe of the subgenital plate is rounded, but not as hairy as in *nitida.*

Besides the four species mentioned are two new species; one from the streams on the higher slopes of the Smokies, and another the only form seen from New England.

Perlesta placida nitida new race

Head and thorax above black, shining, on head there is a pale yellowish spot between eye and hind ocellus, and on margin over base of antennæ the ridge is yellowish, sometimes the spot by the eye is smaller, or almost gone, and the ridge only partly yellowish; abdomen dull black above, below paler on venter, and on sternum dull yellowish, also on under side of legs, above on legs brown to black, tarsi black; antennæ dull yellowish on basal third of fourth, beyond brown; setæ yellowish on first five or six joints, then more or less brown to blackish on basal half to three-fourths with the tip pale, further out the joints are wholly black. Wings blackish, costal area pale yellowish, veins black.

Structure similar to *placida;* hind ocelli a little nearer to eyes than to each other, lateral boss transverse and placed as in *placida;* pronotum in female about twice as broad as long, in male not so broad, narrowed behind, with strong rugæ on each side; hind femora fully as slender as in *placida,* much more slender than in *cinctipes,* the western black species.

The male genital prongs are shorter, more straight than in *placida* and the apical third is the only narrow part; in the female there is a very broad part for the basal three-fourths and at inner tip a short, slender apical part. The subgenital plate has two lobes, each lobe strongly rounded on tip instead of the truncate lobes of other species; these and the apical margin of the ninth segment have many long hairs, more than usual. The V-mark shows two pear-shaped bodies, with a long stem toward the front ocellus.

Expanse 18 mm.

Two females and male from Holliston, Mass., 22, 30 June, 1 July. One male from Pittsfield, N. H., 5 July

(Bks. coll.). Also three from Connecticut; So. Meriden 17 June, 4 July (H. L. Johnson); and Mt. Carmel, 2 Aug. (Sommermann) (teneral), in the Agric. Exper. Station, New Haven.

Type M.C.Z. no. 27673.

Perlesta frisoni sp. nov.

This is the species occurring in the higher parts of the mountains of North Carolina and eastern Tennessee. It is pale yellowish, no dark spot over ocelli; the pronotum yellowish, but with more or less definite brown marmorations on the sides, sometimes making a broad pale brown band each side; below wholly pale, the legs and setæ also pale, sometimes the hind tibiæ are slightly darkened at base above; wings wholly clear, none at all fumose. Antennæ pale on basal fifth or more, beyond dark. The head and pronotum are a little broader than *placida,* the ocellar triangle not as long as in *placida,* the hind ocelli plainly nearer to eyes than to each other, the lateral boss is transverse and about the diameter of an ocellus and below the ocellus.

The V-mark shows two strongly diverging arms, at upper end pointed, at tip very broad, the inner edge concave.

The pronotum in front is not nearly twice as broad as long, and plainly narrowed behind; the anterior angles are quite sharp, and the front margin more strongly bowed than in *placida.*

The genital prongs of the male are broad at base and taper gradually on both sides to the fairly sharp tip. In the female the base of each prong is much broader, the inner tip prolonged into a short, slender point, sometimes very slender like a peg.

In the female the subgenital plate is transverse and truncate, sometimes a median notch, the apical plates (between bases of setæ) are more prominent, and more sharply pointed than *placida,* not so hairy as in *nitida.*

Many specimens from the Smoky Mts., mostly on the Tennessee side in early September, 1930 (Darlington, Carpenter, Banks).

Expanse 19–24 mm.

Type M.C.Z. no. 27662.

2. NEOPHASGANOPHORA AND HARRISIOLA

Failing to examine the genital prongs of the several species proposed in this genus N. & C. lumped all under *Perla capitata* Pictet, the type of the genus. I did not find the type specimen of the species in Europe in 1912, and Ricker does not mention seeing it. Pictet says he had a male; if it were a *Neophasganophora* he could hardly help seeing and referring to the genital prongs, so much larger than in other Perlidæ. His specimen might well be a species much like, but paler than *media*. *Media* is largely black on the head; this similar form, smaller and paler than *media* has a head largely yellowish with a black spot over the ocellar area and a median triangular black mark on the lower face, exactly as Pictet figures *capitata*. This form belongs to *Perla* (or *Togoperla*) and the male has only small genital prongs and often in dried specimens are depressed in the cavity, so as scarcely noticeable. Therefore I replace *Neophasganophora* of Needham with *Harrisiola*, and *Perla flavescens* Walsh as genotype. *Harrisiola* is readily separable, in the male from *Perla* or *Togoperla* by the elongate genital prongs, but both sexes are also separated by the course of the occipital line; in *Harrisiola* the ends of the occipital line bend forward close to the outer edge of the lateral bosses; in *Perla* (*Togoperla*) the line passes well above the lateral boss toward the eye.

In the synoptic table of the species below I have used color, for I find that where we have a number of specimens and from various localities, the color of setæ, of hind femora, and the type of head marking is the same throughout, and that they follow the shape of the male genital prongs, and therefore when specimens, tho few, show differences in these points I treat them as distinct species.

The figure of the genital prong given by Klapalek is not like that of the Loudonville specimens I sent him; and the figures of Needham and Claassen (Plate 19, figures 1 and 2) are not at all the common *flavescens* but probably of *H. americana,* and the female (fig. 3) also fits this species.

1. Hind femora mostly pale, with a broad black band across near base; several joints near base of setæ

pale; apical part of genital prongs divided by a constriction, the outer part slender toward tip; the fifth dorsal segment projecting in a fairly broad lobe. *annulipes.*

Hind femora without a band near base, but often an elongate spot not reaching across .... 2.

2. Hind femora (and others) with upper side black and lower edge with a dark line, sometimes incomplete; setæ wholly black except extreme base of first segment; produced part of fifth dorsal segment broad behind, lightly rounded; last section of genital prongs very long and slender .... 3.

Hind femora (and others) with upper side partly or wholly dark, lower without dark; tip of produced part of fifth dorsal segment not so broad; last section of genital prongs often shorter .... 5.

3. Base of fore wings plainly yellowish, wings pallid; hind corners of head yellow; femora with dark streak above and below; last section of genital prongs scarcely, if at all, scabrous above .... *flavescens.*

Base of fore wings not plainly yellowish, but more or less darkened .... 4.

4. Base of fore wings plainly black, and general surface and veins darkened; head black except a pale dot on each boss and on bases of V-mark; femora almost wholly black, a pale streak on side toward end; apical part of prong scabrous and as long as in *flavescens;* setæ black .... *nigrescens.*

Base of wings not so dark, head with hind corners yellowish as in *flavescens;* wings and veins almost as dark as in *americana;* at least basal half of setæ pale yellowish; apical part of prongs quite short *abbreviata.*

5. Apical part of prongs almost as long as in *flavescens* and not scabrous above; setæ almost wholly pale, scarcely any dark on abdomen; wings an even dull yellowish brown, no pale base .... *tristis.*

Apical part of prongs much shorter, often scabrous above, setæ with only a few joints toward base pale .... 6.

6. Last part of prongs about three times as long as broad, not scabrous, just before tip with a few distinct spicules or short spines; setæ entirely black; pro- meso- and metanotum with an elongate pale spot, tips of femora broadly black across .... *modesta.*
   Last section of prongs scarcely more than twice as long as broad, tip more pointed; no pale marks on thorax above .... 7.
7. Preapical part of prongs but little longer than apical part ....*klapaleki.*
   Preapical part of prongs fully twice as long as the apical part ....*americana.*

Harrisiola flavescens Walsh

This species, easily recognized by the yellowish base to fore wings, is typically from Illinois, but the eastern *marginipes* Provancher is the same species, and occurs from southern Canada down to Washington, D. C. The eastern forms are sometimes a little darker, but the prongs are like those of a Walsh paratype at the M.C.Z. *Perla illustris* Bks. and *P. innota* are synonyms of *marginipes.*

Paratype M.C.Z. no. 10127.

Harrisiola nigrescens sp. nov.

Head and thorax both above and below largely black, with only bosses and a spot on each arm of the V-mark pale, under side of head with a few pale spots, hind part of metasternum pale, abdomen mostly rufous, last five segments with a black apical mark over the posterior part, some on dorsum but more on sides and venter, not nearly reaching middle of venter; the sixth and seventh ventral segments show a median dark area, not as prominent as in *flavescens;* setæ jet black, palpi black, antennæ mostly black, but the basal fourth more or less pale; wings with very distinct dark veins, basal costal area before first cross-vein black, no sign of the yellowish base of *flavescens;* area of anal cell, some in front and beyond also black. Legs mostly black, femora with an elongate pale streak on outer half before tip, tibiæ more brown, but tarsi black.

The fifth segment of male is prolonged about as in *flavescens,* but not such a broad tip; the last section of the genital prongs is long, but not quite as long as *flavescens,* and without any little spinules; last section longer than in *tristis.*

Length of body, 12 mm.; of fore wing 13 mm.

Three males from Antrim Co., Mich., 6 July (Dreisbach).

Type M.C.Z. no. 27719.

Harrisiola annulipes Hag.

The head has a broad black mark from occipital line to front margin, broken by pale between each hind ocellus and the lateral boss and the arms of the V-mark are rather broadly pale. The femora have a broad band across basal half and a narrow band at tip, the upper and lower edges between are pale. The setæ are pale on several basal joints.

The genital prongs are long, the apical section swollen at base and then slightly constricted beyond from where it tapers to the pointed tip, from above this part is seen to be compressed, the preapical part has fairly large spinules above. In the female the ventral plate is rather strongly rounded, on each side is a rounded dark spot and the outer half of the marginal part is dark, the preceding segment has a dark spot in the middle.

It is not uncommon in the vicinity of Washington, D. C. Also occurs at Easton, Pa., and in Montgomery Co., Pa.

Type M.C.Z. no. 249.

Harrisiola tristis Hag.

This was based on two males from Trenton Falls, New York. I have seen no other males like them. The femora are dark along upper edge as in *marginipes*, but the lower edge pale; the setæ are almost entirely pale; there is black between the hind ocelli and bosses. It is a small species, and a female from the Delaware Water Gap is of the same size and may belong to it, with the femora dark above and pale below and pale setæ. The last section of the genital prongs has the upper edge more strongly curved than in *flavescens,* and, from side, is broader in the middle. The head has a little more pale in front than *flavescens,* venter pale, antennae pale for some distance. The prongs are long, the apical part very long and much curved down, and not scabrous above.

Type M.C.Z. no. 245.

Harrisiola americana Bks.

This has the head black behind occipital line, pale each side between hind ocellus and boss, and pale over the V-mark. The genital prongs show a rather short apical part, and long basal part with erect hairs and numerous spicules above, the two parts separated by a strong constriction. The hind femora are partly or wholly dark on upper edge, the lower edge pale; setæ mostly dark, but a few joints at base pale.

Type M.C.Z. no 11324.

Harrisiola klapaleki sp. nov.

This is very similar to *americana,* but differs in the much shorter preapical part of the genital prongs. The hind femora have more black on basal part above; but the lower margin is dark only near base.

The female has the ninth segment below black each side, pale in middle, the subgenital plate less convex (not lobed as in *americana*), and black or dark, except for the pale apical depression.

From Loudonville, Ohio, 6 July (Osburn).

Type M.C.Z. no 27717.

Harrisiola modesta sp. nov.

Head largely yellow, ocellar area black, and a broad dark band below the V-mark. The pronotum has a pale median streak, not reaching front and broader behind, an irregular pale spot on middle of meso- and metanotum. Tip of femora broadly black across; setæ entirely black; last ventral segment (9) has a dark spot each side near outer margin; wings mostly blackish.

Last section of genital prongs much shorter than in *flavescens,* about three times as long as broad (from side) not, or scarcely broadened in middle, nearly cylindric, not scabrous above, but tip of preapical part with a few spinules.

From Marietta, Ohio, 7 June (Holden).

Type M.C.Z. no. 27718.

Harrisiola abbreviata sp. nov.

Head marked much as in *flævescens,* the hind corners yellow; femora with a black streak above near base and another near tip, lower edge narrowly black, hind tibia almost wholly pale; wings and veins darkened, almost as much as in *americana,* no flavescent base; venter with dark side and two dark spots in the middle; antennæ dark; setæ with at least basal half pale yellowish.

Genital prongs with the apical part much shorter than in *flavescens,* and not scabrous above, but preapical part has a few spinules near tip above.

A little smaller than *flavescens.*

Taken near Grand Gorge in the Catskill Mts., N. Y., in the latter part of June 1889 (Bks).

Type M.C.Z. no. 27720.

3. Some new species

Pictetia bimaculata sp. nov.

Brown marked with pale yellowish, ocelli joined by fairly broad, almost black lines, a pale yellowish triangle within, laterally, each side of the front ocellus the dark is extended nearly to the margin of head. Most of the middle of face is a paler brown as in figure, pale yellow on bosses and over and between the V-mark. Head between eyes convex and here broader than long, behind eyes the sides curve inward; ocelli in triangle about one and one-third times as broad as long, hind ocelli scarcely as near to eyes as to each other; palpi brown, maxillary palpi very slender, third and fourth joints about equally long and each about as long as an eye. Antennæ black, fourth and fifth joints each broader than long, clothed with short, pale hair and near end of each joint the very short, erect sense hair.

Pronotum not quite twice as broad in front as long, anterior side plainly convex, anterior corners projecting a little, behind much narrower than in front, with a broad, pale median stripe, and each side including margin, dark brown; inner two-thirds of each side with short, irregular ridges; rest of thorax black above, brown below; legs rather evenly pale brownish, tarsi black; abdomen dull brown above and below, ninth ventrite with a rounded, swollen black spot each side; ventral plate broad, and broadly rounded.

Wings faintly tinted, veins not very dark, anal cell about twice as long above as broad at tip; anal brace reaches from near base of cell across anal area, but no anal lobe here; cubito-anal cross-vein plainly its length beyond cell, not darkened; subcosta ends some distance before cord, only a few costal cross-veins, and one beyond cord; radial sector forks once not far beyond cord; in hind wings no extra cubital cross-veins; abdomen fully as long as head and thorax.

Length of body 12 mm.; of fore wing 12 mm.

From Digby, Nova Scotia, 28 May 1905 (Russell).

Type M.C.Z. no. 27723.

Atoperla consors sp. nov.

Head dark brown; only the antennal ridge opposite antennæ and the basal part of the V-mark pale; palpi brown; antennæ pale on basal part, soon becoming brown. Legs dull yellowish brown, tarsi darker; thorax and abdomen dark brown, setæ pale yellowish.

Head only a little longer than broad, not as much longer as in *ephyre;* dark spots on ninth ventrite sometimes showing; wings fully as slender as in *ephyre.*

Ventral plate of female shows a median broad V-line, and from each end a line at first curving in and then rounding out, with outline of a square in the middle, otherwise very similar to *A. ephyre.*

Length body 8 mm.; of fore wing 10–11 mm.

From Kingston, R. I., 23 June (Barlow); Pittsfield, N. H., 5 July (Bks). Differs in the almost uniformly dark head, which is a little shorter, and in details of the ventral plate.

Type M.C.Z. no. 27722.

Neoperla clymene subsp. **mainensis** nov.

This form differs radically from the common form in the blackened body and wings; head and thorax deep black, sometimes a little rufous each side of anterior ocellus; antennæ mostly black, a few joints beyond second paler. Wings with black veins and the membrane infuscate, even the costal border of fore wing is black at base and beyond scarcely yellowish, only not as dark as rest of wing; abdomen black above and below, extreme tip above in genital area paler; femora dark brown to black, the lower edge paler; setæ pale, with dark at tips of joints, and farther out wholly black.

The ocelli are a little more separated than is usual in *N. clymene.* The genital prongs, instead of slightly evenly curved, are bent so that the apical part is parallel to its fellow; the slender conical process on the seventh dorsal segment is longer than in typical *clymene,* and extends over most of the next segment.

Type M.C.Z. no. 27725.

Mr. A. Loveridge has taken numerous specimens of this black form at Rome, Maine, 26 June to 8 July.

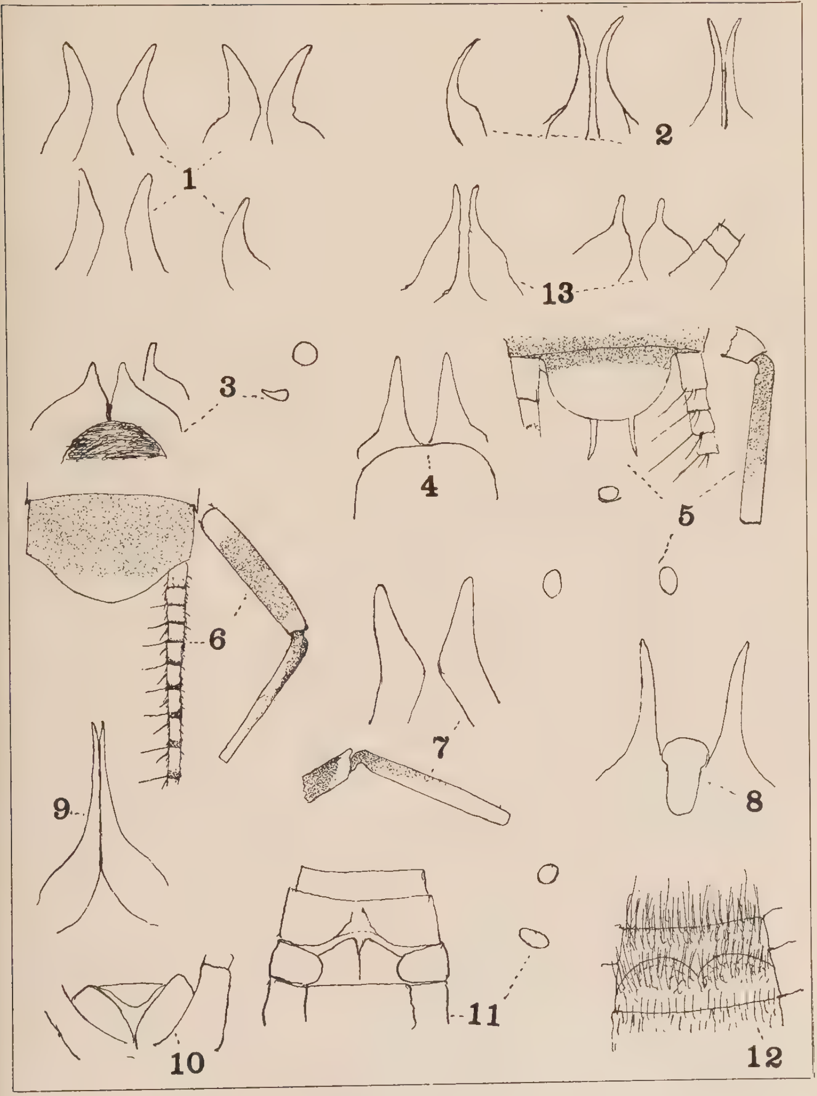
Peltoperla nigrisoma sp. nov.

Body above and below jet black, except a pale yellowish triangular spot over anterior corners of face from eye

---

EXPLANATION OF PLATE 11

Fig. 1. *Perlesta decipiens,* male genital prongs, and one from side.
Fig. 2. *Perlesta placida,* male genital prongs, and one from side.
Fig. 3. *Perlesta frisoni,* female anal plates, and ocellus and boss.
Fig. 4. *Perlesta frisoni,* male genital prongs.
Fig. 5. *Perlesta texana,* tip of abdomen, ocelli, and hind tibia.
Fig. 6. *Perlesta cinctipes,* tip of abdomen, seta, hind femur and tibia.
Fig. 7. *Perlesta brunneipennis,* male genital prongs, and hind tibia.
Fig. 8. *Perlesta texana,* male genital prongs.
Fig. 9. *Perlesta cinctipes,* male genital prongs.
Fig. 10. *Perlesta placida,* tip of female abdomen from below.
Fig. 11. *Perlesta frisoni,* subgenital plate of female, and ocellus and boss.
Fig. 12. *Perlesta nitida,* subgenital plate.

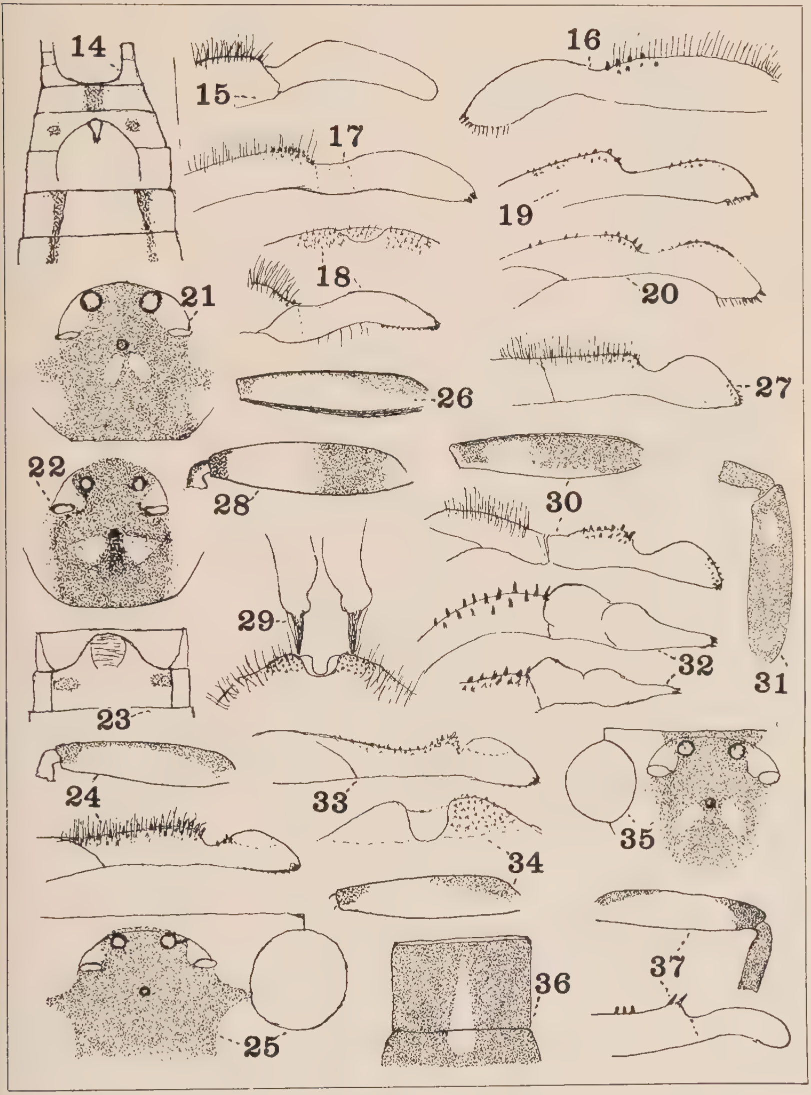


Banks—Perlidæ

EXPLANATION OF PLATE 12

Fig. 13. *Perlesta nitida,* (left) prongs of male, (right) of female.
Fig. 14. *Harrisiola flavescens,* venter of female.
Fig. 15. *Harrisiola flavescens,* genital prongs of paratype.
Fig. 16. *Harrisiola tristis,* genital prong.
Fig. 17. *Harrisiola flavescens,* genital prong of marginipes form.
Fig. 18. *Harrisiola flavescens,* prong from another view and edge of fifth segment.
Fig. 19. *Harrisiola nigrescens,* genital prong.
Fig. 20. *Harrisiola nigrescens,* genital prong, another view.
Fig. 21. *Harrisiola flavescens,* face.
Fig. 22. *Harrisiola annulipes,* face.
Fig. 23. *Harrisiola americana,* ventral plate.
Fig. 24. *Harrisiola americana,* femur and genital prong.
Fig. 25. *Harrisiola modesta,* face.
Fig. 26. *Harrisiola marginipes,* femur.
Fig. 27. *Harrisiola klapaleki,* genital prong.
Fig. 28. *Harrisiola annulipes,* femur.
Fig. 29. *Harrisiola annulipes,* ends of prongs, and tip of fifth segment.
Fig. 30. *Harrisiola klapaleki,* femur and genital prong.
Fig. 31. *Harrisiola nigrescens,* femur.
Fig. 32. *Harrisiola annulipes,* genital prongs.
Fig. 33. *Harrisiola americana,* genital prong and tip of fifth segment.
Fig. 34. *Harrisiola americana,* femur.
Fig. 35. *Harrisiola klapaleki,* face.
Fig. 36. *Harrisiola modesta,* pronotum.
Fig. 37. *Harrisiola modesta,* femur, and genital prong.

PSYCHE, 1948 VOL. 55, PLATE 12

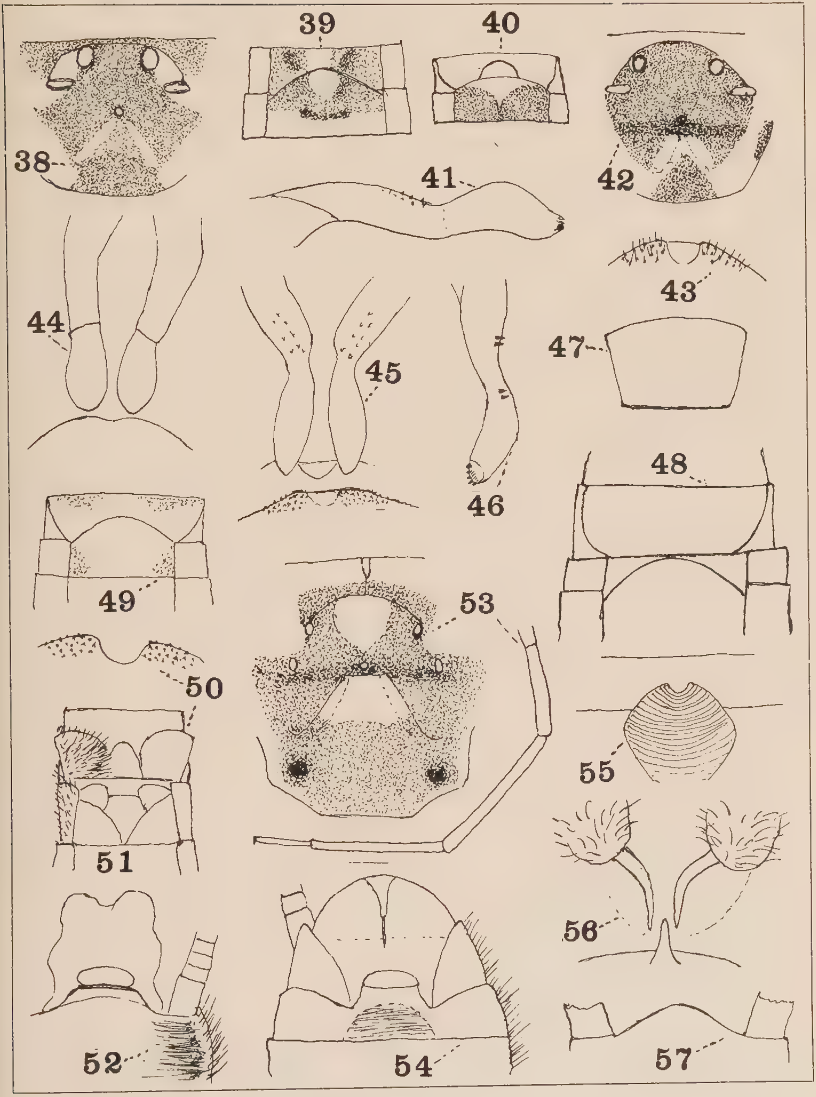


Banks—Perlidæ

EXPLANATION OF PLATE 13

Fig. 38. *Harrisiola abbreviata,* face.
Fig. 39. *Harrisiola klapaleki,* ventral plate.
Fig. 40. *Harrisiola tristis,* ventral plate.
Fig. 41. *Harrisiola abbreviata,* genital prong.
Fig. 42. *Harrisiola tristis,* face.
Fig. 43. *Harrisiola modesta,* tip of fifth segment.
Fig. 44. *Harrisiola abbreviata,* prongs from above.
Fig. 45. *Harrisiola marginipes* form, prongs from above.
Fig. 46. *Harrisiola modesta,* genital prong.
Fig. 47. *Pictetia bimaculata,* pronotum.
Fig. 48. *Pictetia bimaculata,* ventral plate.
Fig. 49. *Perla capitata,* ventral plate.
Fig. 50. *Harrisiola abbreviata,* tip of fifth segment.
Fig. 51. *Atoperla consors,* venter of female.
Fig. 52. *Peltoperla nigrisoma,* tip of abdomen above.
Fig. 53. *Pictetia bimaculata,* face, and maxillary palpi.
Fig. 54. *Peltoperla nigrisoma,* tip of abdomen below.
Fig. 55. *Neoperla clymene mainensis,* ventral plate.
Fig. 56. *Neoperla clymene mainensis,* genital prongs.
Fig. 57. *Neoperla clymene mainensis,* tip of abdomen above.

PSYCHE, 1948 VOL. 55, PLATE 13



Banks—Perlidæ

down, and the hind border of pronotum is whitish. Wings pale brown, veins a darker brown; femora dull yellowish brown, tibiæ scarcely darker except tip is black, as also tarsi. Antennæ nearly all black except pale toward base. Abdomen with erect short hair below, and on lower sides with much longer hair, usually turned inward from each side, upper sides with some short, erect hair. The wings are much like others; radial sector forked once, no cubital cross-veins in hind wings, thirteen costals before end of subcosta. The head is not quite as short as in *brevis,* hind ocelli a little nearer to each other than to eyes. The ninth ventrite has a transverse knob about two and one-half to three times as broad as long.

Length of body 7 mm.; of fore wing 9 mm.

From Sequoia Park, California, 5000 ft., 6 June (Melander).

Type M.C.Z. no. 27724.

NOTES ON *TABANUS ATRATUS* SUBSP. *NANTUCKENSIS* HINE (DIPTERA)

By Norman S. Bailey
Biological Laboratories, Harvard University

In the course of my field work with the saltmarsh Tabanidæ during the summers of 1946 and 1947 some observations were made on this representative* of the black horsefly which occurs along the coast from New Hampshire to New York. Although adults are never abundant, their large size and noisy flight make them conspicuous on the marshes. During the 1947 season (from late May to September 11th) only 16 specimens (5 males and 11 females) were taken whereas hundreds of *Tabanus nigrovittatus* Macquart (Bailey, 1947) could readily be captured in a short time on almost any day from early July to late August. The first specimen, a male, was collected on July 12th on the Pine Island Marsh in Newbury. Stone (1938) notes June 19th as the earliest record at Dorchester, Massachusetts and Johnson (1919) gives the other seasonal extreme of September 8th at Rochester, New Hampshire. My latest record is a female from Pine Island on September 11th. There is something of interest in the fact that all of my earlier 1947 captures were males. The second one was taken at Ipswich on July 16th, two more on July 24th at Newbury, and the final male at the last mentioned locality on August 27th. Females, possibly of this subspecies, were seen annoying horses in a field above the Parker River saltmarshes on July 15, 1946. In 1947, however, the first female was observed, in the act of ovipositing, on August 19th. From that day until September 8th one or two were seen, and usually taken, on each of my almost daily trips to the marsh.

Pine Island is a partly wooded knoll, large enough for a few cottages, that lies in the midst of the saltmarsh somewhat less than half-way from the mainland proper to Plum Island. It is about a half of a mile from the upland to the Island over a gravel road that rises only 2–4 feet above the marsh. Usually I drive along this causeway to the mid-section where a small ditch, running parallel to the road on the north, overflows to form a broken chain of small shallow pools. Where these begin I shift into low gear and drive on slowly while watching for Tabanids. The larger ones are readily seen and egg masses can frequently be spotted in this manner. It is convenient to turn in a driveway at the edge of the Island and then drive back to park beside the ditch wherever anything of interest has been noted. Ordinarily, ovipositing females are not easily disturbed and they may be casually approached without any special precautions.

---

* My thanks to Dr. Joseph C. Bequaert for this determination.

My experience with the first female is of some interest in this respect. She was busy ovipositing on a blade of *Spartina glabra* Muhl. var. *alterniflora* (Loisel.) Merr. which grew thinly in the shallow water of the pond margin. They show a strong preference for scattered culms rather than dense stands and eggs were found only on this plant. It was about 4 p.m. when she was first observed as I drove towards the Island. (All time E.D.S.T.) There I turned and went back to park as indicated above. Then I crossed the ditch and skirted the pond to get a closer look at her. She seemed quite indifferent as I carefully moved to within a foot of her and even touched the tip of the blade she was laboring on. For several minutes I watched her lay her eggs in the manner so well described by Hine (1903, 1906) for *Chrysops callidus* O. S. and *C. moerens* Walker. Then I decided to return to the car for a container in which to take her alive. She was still at work when I got back, but just as I was reaching out to lower the jar over her she flew away. Her egg mass was probably nearly complete since she had been ovipositing for at least an hour by that time. It measured 15 mm. long by 5 mm. wide at the base. The eggs were glistening white then but by 6 p.m. had become dull and somewhat greyish. By 9:30 the mass was mottled greyish brown and subsequently darkened but slightly. The upper ends of the eggs are a bit darker, which gives the appearance of stripes on close inspection since they are so uniformly placed in the mass. Cameron (1926) states that the darkening process takes about six hours for *Chrysops* eggs, which become jet black. He notes that the pigmentation develops much more rapidly in full sunlight than in the laboratory.

The egg mass of *T. atratus* Fabricius has been described in detail by Hart (1895), and Schwardt (1936) provided photographs which agree closely with Hart's description. Schwardt also states "*T. atratus* deposits its eggs in masses which are so constant in structural plan as to make specific determination of the egg mass readily possible." This is especially noteworthy since the egg masses of the subspecies *nantuckensis* are strikingly different (see Figure 1). In the words of Hart (1895), *atratus* egg masses are "subconic, with oval base, 10–15 mm. long and 8–10 mm. wide, height 5–7 mm.; sides convex or concave, apex correspondingly rounded or pointed. . . . The eggs are stacked in four or five tiers, one above another, and gummed together in a firm mass." This is the type very rarely found on the saltmarsh where the usual form of the egg mass closely resembles the basal one in the accompanying figure.

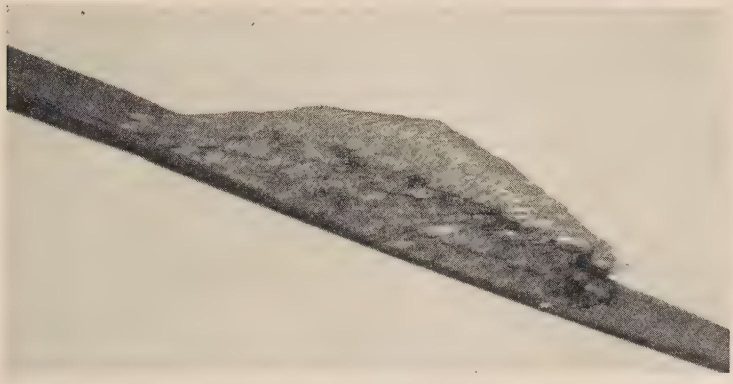


Fig. 1. Egg masses of *Tabanus atratus nantuckensis.* Photograph by Arthur F. Dewsnap, Jr. (About 4 × natural size)

The measurements given by Hart (1895) and by Stone (1930) suggest a maximum of 2:1 for the length to width ratio of *T. atratus* egg masses whereas those of the subspecies *nantuckensis* have a minimum ratio of 3:1 and may be over 7:1. This difference in proportions is very characteristic and accounts for a marked difference in the appearance of the saltmarsh egg masses. They are no wider than the supporting grass blade while those of *atratus* may be twice as wide. There may be a possible connection between the more uniform exposure of the eggs in these thinner, extended masses and the temperature conditions of the coastal marshes. *Nantuckensis* egg masses vary at least from 15–35 mm. in length. However, they are very regularly only 4–5 mm. wide which is nearly the width of the *Spartina* blade. Generally they are laid in 2–3 well defined layers and at the highest point the mass will measure only 3–4 mm. Study of the figure will reveal that it is a photograph of a double egg mass. Horseflies not uncommonly add their eggs to previously deposited masses. However, the circumstances were somewhat unusual in this case.

About noon on August 22nd a restless female was seen flying from plant to plant along the border of the roadside ponds at Pine Island. She was apparently selecting an egg site, as subsequent events proved. After stalking her for several minutes, I succeeded in capturing her and put her in a small jar with a blade of grass bearing an egg mass that I had found shortly before. When I reached camp half an hour later she was already busily ovipositing directly over the older mass and continued without interruption until 2:05 p.m. She probably started to lay between 12:30 and 12:45 and, therefore, was so engaged for nearly an hour and a half. As the photograph clearly shows, she neatly arranged her eggs over the older mass. The picture was taken at 4:30 p.m. on August 23rd when the fresher eggs were about 27 hours old. The older ones beneath had hatched in mass early that morning.

The ovipositing behavior of two other females was sufficiently aberrant to mention. When discovered one had laid about three quarters of her eggs and the second had deposited about a third of hers. Those of the first were in three small discreet clusters on the same grass blade. She was put into a pint container with her eggs and while there laid another little batch on the inside of the box. Very few of these eggs produced larvæ.

The other female was handled in the same manner. The form of her egg mass was not unusual, but she apparently lost her sense of direction in the darkness of the container and laid the rest of her eggs in a neat pattern well below the others and with her head up, facing them. This final batch was stacked in four tiers and was, consequently higher than usual.

Hine (1903) stated that, ''Between nine o'clock and noon seems to be the favorite time of day for oviposition with the various species of both *Chrysops* and *Tabanus*, and I have seldom been able to observe females ovipositing at other hours of the day.'' My own observations for *nantuckensis* are just the reverse. All ovipositing was seen in the afternoon—from just after 12 until 5 p.m. However, Cameron (1926) is probably justified in saying that oviposition may take place at any time between 8 a.m. and 5 p.m. on bright days in June and July—and, I would add, in August. It is very likely that there is some such activity in the morning on the saltmarsh, but certainly it is not restricted to the forenoon hours in Essex County.

The incubation period was obtained for three egg masses. Hatching occurred in the early morning in one instance and probably at that time of day in the others. A mass deposited on August 19th hatched on August 26th after an incubation of seven days. The other two, laid August 27th and 29th, hatched on September 5th and 7th respectively after incubating 9 days. In each case the blade of grass was stuck into sand in a pint jar. Water covered the sand to a depth of half an inch and the eggs were at a level just below the rim of the uncovered jar in a relatively moist atmosphere. However, the containers were kept indoors and this probably lengthened the incubation period appreciably. The 7 and 9 day periods correspond with those similarly obtained by Hart (1895) and by Hine (1906), in that order, for *T. atratus* Fabricius, while Schwardt noted a 5 day period for eggs of this species in an outdoor insectary in Arkansas. Full sunlight undoubtedly hastens development.

Among the egg masses taken at the same Pine Island locality in 1946 were two, having all the characteristics described for known masses of *T. atratus* subsp. *nantuckensis,* from which hymenopterous parasites were reared. These were kindly identified for me as the Proctotrypid *Telenomus goniopis* Crawford by C. F. W. Muesebeck. As far as I have been able to ascertain, this species has previously been reported only twice. It was originally described from specimens reared by McAtee from eggs of *Goniops chrysocoma* (O. S.) found on Plummer's Island, Maryland in 1910 (Crawford, 1913). During the 1932 season Schwardt (1936) collected many egg masses of *Goniops* in Arkansas which were similarly destroyed. Therefore, this note reveals another host genus and a considerable extension of range. Although several egg masses were collected and reared in 1947, no parasites appeared. Most of these were taken while the flies were still ovipositing or were laid entirely in captivity. Consequently, they were not long exposed to normal environmental hazards. One of the parasitized egg masses was found on August 13, 1946 and the parasites emerged on August 20th. At the time of preservation, 54 specimens of *T. goniopis* (8 males and 46 females) had emerged. Others were still within many of the eggs. The relatively small number of males produced is apparently usual for this insect.

In reducing *nantuckensis* to a variety of *atratus* and in naming the variety *fulvopilosus,* Johnson (1919) calls attention to the considerable amount of variation seen in this species in coastal areas and raises the question of the influence of the environment as the agent responsible for it. Stone (1938) mentions the fact that many females have both the wing color that distinguishes *nantuckensis* and the lateral tufts of fulvous hairs just above the wing bases which are characteristic of *fulvopilosus.* It is of further interest to note that no males bearing such fulvous hairs have ever been collected. Five of the eleven females taken at Pine Island in 1947 (from August 20th to September 8th) had both varietal features. Two of them laid egg masses which were no different from others found on the saltmarsh. It appears that these names designate the extreme forms in a population showing marked variability. Whether the basis of this variability is genetic, the result of physiological responses to environmental factors or, perhaps, both deserves investigation. Present evidence at least suggests that the *fulvopilosus* condition may be sex linked inheritance. Since there are females with both varietal characters and with no other recognized differences, the validity of distinct names seems questionable. On the other hand, if the form of the *atratus* egg mass has the specific significance indicated by Schwardt (1936), the status of *nantuckensis* needs clarification from this angle as well.

A few observations on the larvæ and pupæ demand notice. The former are most commonly found under mats and piles of straw and other plant debris which becomes stranded in soggy spots subject to frequent tidal flooding or sufficiently depressed to hold rain water. Where such trash lies on soft mud in very shallow water they are especially common. If uncovered they retreat by burrowing rather rapidly into the surface muck. Now and then one may be found in the thick algal mats on the surfaces of deeper pools. These saltmarsh larvæ closely resemble typical *atratus* larvæ as described by Walsh (1863), Riley (1870), Stone (1930), et al. but should be examined critically for possible differences. It would also be interesting to rear some under conditions comparable to (a) salt and (b) fresh marsh habitats to determine what influence, if any, the environment has in the production of the variation characteristic of the adults.

Pupal cases are often numerous in the drift left at the edge of the marsh by exceptionally high tides. This leads one to wonder at the relative scarcity of the flies themselves. The cases may also be found protruding from heaps of straw along the ditch banks. Yet only rarely are living pupæ encountered. One was located on the Parker River saltmarsh just east of Route I on July 17, 1947, and a male emerged on July 21st. This specimen was killed while still somewhat teneral and was reared indoors. The coloration of his wings is only slightly less uniform than in typical *atratus*.

SUMMARY

Original observations on the seasonal distribution, abundance, oviposition, egg masses, incubation period, probable larvæ and the pupæ of *Tabanus atratus* subsp. *nantuckensis* Hine are given. Males were taken from July 12th to August 27th and females from August 19th to September 11th on the saltmarshes of Essex County, Massachusetts. A figure of two egg masses, one superposed on the other by a captive female, shows that the structural plan is notably different from that of typical *atratus* figured by Schwardt (1936) and noted by him to be specifically distinct. The ratio of length to width is not over 2:1 for typical *atratus* egg masses while those of the subspecies *nantuckensis* may be 7:1 and are normally at least 3:1. The incubation period was 7–9 days for egg masses kept indoors between August 19th and September 7th. Probable larvæ of this subspecies occur rather commonly in soggy mats of plant debris on bare mud or where shallow water covers the mud. Pupal cases are numerous in the marsh drift but living pupæ are only rarely recovered from the piles of straw. The question of the validity of the present status of these variants of *Tabanus atratus* Fabricius is raised. *Telenomus goniopis* Crawford is reported as an egg parasite of this species for the first time and with a notable extension of its range.

BIBLIOGRAPHY

Bailey, N. S. 1947. Psyche, 54(1): 62–64.
Cameron, A. E. 1926. Bull. Ent. Res., 17(1): 14–17.
Crawford, J. C. 1913. Proc. U. S. Nat. Museum, 45: 243–244.
Hart, C. A. 1895. Entomology of the Illinois River, pp. 242–247.
Hine, J. S. 1903. Ohio Acad. Sci., Special Paper No. 5: 4–5.
1906. U.S.D.A. Tech. Series 12(II): 36–38.
1917. Ohio. Jour. Sci., 17: 271.
Johnson, C. W. 1919. Psyche, 26: 163–164.
Philip, C. B. 1947. Amer. Midl. Nat., 37(2): 302–303.
Riley, C. V. 1870. Second Missouri Report, p. 128.
Schwardt, H. H. 1936. Ark. Agri. Exper. Station Bull. 332: 14–15, 27–32.
Stone, Alan. 1930. Ent. Soc. Amer., Ann., 23: 261–304.
1938. U.S.D.A. Miscl. Publ., 305: 89.
Walsh, B. D. 1863. Proc. Boston Soc. Nat. Hist., 9: 304.

THE GENERIC NAME *TROMBICULOIDES* JACOT, 1938[1]

By G. W. Wharton
Department of Zoölogy, Duke University

Jacot (1938) obtained some specimens of mites and identified them as *Trombidium scabrum* Say, 1821. However, he realized that his specimens were not representative of the genus *Trombidium.* Therefore the new generic name *Trombiculoides* was proposed, with *Trombidium scabrum* designated as type. His generic diagnosis was based however, on his specimens and not on Say's description. Say's description was disregarded whenever a discrepency arose between the specimens and the description.

Ewing 1946 reported that Jacot had misidentified his specimens and that *Trombidium scabrum* was in reality a species of *Sericothrombium.* Ewing therefore considered *Trombiculoides* a synonym of *Sericothrombium* Berlese, 1910. Furthermore he points out that Howard (1918) had given an excellent account of the species including figures of both larval and adult stages. It is obvious from the descriptions of Howard and Jacot that they are not dealing with the same or even closely related species. On the other hand it is also obvious that Say's description is so incomplete that his name *T. scabrum* might apply to any one of several species in different families, or might refer to a concept that includes a complex of several species.

Jacot's specimens were borrowed from the Museum of Comparative Zoölogy through the courtesy of Dr. Bequaert. A study of the specimens showed that they were compared with specimens of *Eutrombicula alfreddugèsi* Oudemáns, 1910 from cultures, and no significant differences between the two could be noted. It is impossible to identify Jacot's specimens as *Eutrombicula alfreddugèsi* at the present time, however, because this species can be

---

[1] This paper is a report on work done in connection with a Grant-in-Aid from the Research Grants Division of the U. S. Public Health Service.

recognized as distinct from *Eutrombicula masoni* (Ewing, 1943) only on the basis of larval characteristics.

According to Opinion 168 of the International Commission on Zoölogical Nomenclature, "it is to be assumed that the original author of a genus correctly identified the species assigned by him there to, ... but that, where there is evidence that . . . . (this) assumption(s) is at variance with the facts, the case should be submitted with full details to the International Commission on Zoölogical Nomenclature, and that pending their decision thereon, the genus should be regarded as of doubtful status."

In this case it seems that there is evidence that Jacot misidentified the specimens on which he based *Trombiculoides.* The facts will be presented to the International Commission on Zoölogical Nomenclature. It therefore follows that until the Commission acts, *Trombiculoides* Jacot, 1938 must be considered as of doubtful status.

Fortunately *Eutrombicula* Ewing, 1938, the name now used for the genus that includes the specimens on which Jacot based his *Trombiculoides,* has priority over *Trombiculoides* Jacot, 1938. The date of *Eutrombicula* is 15 June 1938 while that of *Trombiculoides* is 10 October 1938. Therefore no change in the generic names is anticipated in settling the status of *Trombiculoides* Jacot, 1938.

REFERENCES

Ewing, H. E. 1938. A key to the genera of chiggers (mite larvae of the sub-family Trombiculinæ) with descriptions of new genera and species. J. Wash. Acad. Sci., 28: 288–295.

Ewing, H. E. 1946. Notes on the taxonomy of three genera of trombiculid mites (chigger mites), together with the description of a new genus. Proc. Biol. Soc. Wash., 59: 69–72.

Jacot, A. P. 1938. Thomas Say's free-living mites rediscovered Psyche. Boston, 45: 121–132.

Say, T. 1821. An account of the arachnids of the United States. Jour. Acad. Nat. Sci., Philadelphia, 2: 59–83.

SEVEN NEW FLEA BEETLES FROM THE WEST INDIES (COLEOPTERA—CHRYSOMELIDÆ)[1]

By Doris H. Blake
Arlington, Va.

This paper contains descriptions of seven new flea beetles from Jamaica, Hispaniola and Puerto Rico in the collection of the Museum of Comparative Zoology at Cambridge. Five of these were collected by P. J. Darlington.

Lactica xanthotrachela n. sp.

Fig. 1

From 3–4 mm. in length, elongate oblong, shining, dark blue or green with yellow head and thorax and deep brown antennæ, mouthparts and legs, hind legs usually with metallic lustre.

Head with interocular space over half its width, shining, smoothly rounded over occiput with a large puncture on either side near eye and obsolete small punctures on front, tubercles more or less distinctly marked, the space between antennal sockets a little produced and rounded; mouthparts dark. Antennæ with slightly paler basal joints, deep brown otherwise, third joint shorter than fourth, remainder subequal. Prothorax not quite twice as broad as long with almost straight sides and deep and very slightly sinuate basal sulcus; surface shining and finely punctate. Elytra more distinctly punctate than prothorax, very shining, green or blue, the humeri well marked by a short intrahumeral sulcus, otherwise the elytra smoothly convex. Epipleura wide but disappearing before the apex. Body beneath lustrous, the pale color of thorax extending down to the coxæ of the middle legs, rest of undersurface lustrous black or with metallic blue color, and finely pubescent. Legs dark, the hind ones, at least, with metallic lustre. First tarsal joint of hind legs long, claws appendiculate. Length 3.1–4.1 mm.; width 1.5–2 mm.

---

[1] Published with a grant from the Museum of Comparative Zoölogy at Harvard College.

Type male and 5 paratypes M.C.Z. Type No. 27797. 1 paratype in U.S.N.M. Cat. No. 58723.

Type locality.—Mandeville, Jamaica, collected by A. E. Wright.

Other localities.—Pt. Antonio, Jamaica, collected by A. E. Wright, Dec. 1931; "Jamaica," collected by L. G. Perkins, in the Stuart T. Danforth collection.

Remarks.—In coloration this species is similar to a great many others that occur on the continents both of North and South America, but upon careful comparison I have not been able to find any other species that entirely corresponds with this Jamaica species. For instance, *L. iris* (Oliv.) of North America has pale front and middle legs; *L. elegans* Harold of Colombia has a pale margin on the elytra, *L. semiviolacea* Jac. and *L. mexicana* Jac. and *L. hogei* Jac. are all much larger.

Lactica darlingtoni n. sp.

Fig. 2

From 3–3.5 mm. in length, elongate oblong, shining, deep blue or blue green with black antennæ, legs and undersurface, the two latter often with a blue or green lustre; very finely punctate.

Head with interocular space more than half its width, very polished over occiput and front with a median line between tubercles extending upwards (in one specimen) to end in a small depression in middle of the front; a large puncture on either side near the eye; frontal carina between antennal sockets somewhat produced, rounded. Antennæ scarcely reaching the middle of the elytra, 3rd joint shorter than 4th, the basal joints with a metallic lustre. Prothorax twice as wide as long with slightly curved sides and explanate margin and a well marked basal sulcus, surface polished, very finely punctate. Elytra elongate, the humeri small with a short intrahumeral sulcus and slight transverse depression below basal callosity; surface polished, very finely but distinctly punctate throughout. Epipleura broad, gradually diminishing and disappearing before the apex. Body beneath usually with a metallic lustre, very finely pubescent.

First joint of hind tarsi long, claws appendiculate. Length 3.1–3.5 mm.; width 1.5–1.7 mm.

Type male and 3 paratypes M.C.Z. Type No. 27798. 1 paratype in U.S.N.M. Cat. No. 58724.

Type locality.—Whitfield, Blue Mts., Jamaica, elevation 4500 feet, collected in Aug. 1930 by P. J. Darlington.

Remarks.—In coloration this is similar to *L. violacea* Jac. described from Guatemala and Panama. It differs from that species in being a little more elongate and with extremely fine punctation which is the same throughout, not disappearing at the apex as in *violacea.* The sculpture of the head with its distinctly marked frontal tubercles also appears different, and the sulcus across the prothorax is not sinuate at all but straight.

Lactica porphyrea n. sp.

Fig. 3

From 2.5–3 mm. in length, ovate, shining yellowish or reddish with violet elytra and dark abdomen; only faint traces of a basal sulcus across the prothorax most marked on each side at the limiting ends; elytra distinctly and rather densely punctate.

Head with interocular space over half its width, frontal tubercles and space between the antennal sockets somewhat elevated with a depressed spot or area above the tubercles, the surface of the occiput and front and frontal carina densely and shallowly punctate and alutaceous; a large puncture on either side of front near the eye. Antennæ more than half the length of the beetle, third joint shorter than fourth, remainder subequal and rather heavy. Prothorax fully twice as wide as long with arcuate sides and narrow explanate margin; surface smooth, polished and fairly alutaceous with sparse punctation; across base an ill marked and, in some specimens, very indistinct trace of sulcus, the rather faint limiting depressions at either end the most distinct part of it. Scutellum usually deep reddish brown. Elytra with small humeri and a slight basal callosity, very shiny deep violet, with dense distinct punctation in basal half becoming smoother near the apex. Epipleura wide, gradually diminishing to end shortly before the apex. Body beneath shining yellowish or reddish with dark brown abdomen, very finely pubescent. Hind tibiæ with a short spur, first tarsal joint of hind legs long, claws appendiculate. Length 2.6–2.9 mm.; width 1.5–1.6 mm.

Type male M.C.Z. Type No. 27799 and four paratypes, 1 in the U.S.N.M. Cat. No. 58725.

Type locality.—Mt. Diego de Ocampo, circa 3—4000 ft. elevation, Dominican Republic, collected in July 1938 by P. J. Darlington.

Remarks.—The extremely indistinct sulcus on the prothorax of many of the specimens at first confuses one as to the generic place of this beetle, but *Lactica* seems to be the genus to which it most closely corresponds.

Lactica megaspila n. sp.

Fig. 5

About 3 mm. in length, oblong ovate, shining, yellow brown, antennæ with the outer joints dark, elytra with four large dark spots having a greenish lustre, two at base and the other two at the apex of the elytra.

Head rather deeper brown on the occiput, possibly with aenous lustre in some specimens, densely and obsoletely punctate with a few larger punctures on inner side near the eye; frontal tubercles well marked with a depression above, the space between the antennal sockets a little produced; lower front rather short; interocular space over half the width of the head. Antennæ extending to the middle of the elytra, third joint shorter than the fourth, remainder subequal, the three basal joints paler. Prothorax not twice as broad as long, moderately convex with a wide explanate margin on sides and a clearly marked basal sulcus deepest at limiting ends; surface finely punctate. Elytra shining yellow brown, each with a basal and larger apical spot, the basal spot extending nearly across the base, the apical spot extending from the middle almost to the apex, in the apical spot an aeneous lustre; a short intrahumeral sulcus and depression behind the basal callosity; surface shining, very faintly punctate, a wide explanate margin along the sides. Epipleura wide, gradually disappearing before the apex. Body beneath pale, shining beneath the short pale pubescence; hind tibiæ with small spur, first tarsal joint moderately long, claws appendiculate. Length 3.1 mm; width 1.6 mm.

Type male M.C.Z. Type No. 27800.

Type locality.—Villalba, Puerto Rico, collected by C. M. Matos June 28, 1934, in the Stuart T. Danforth collection.

Remarks.—There are two species from Central America that have somewhat similar markings,—*L. nigromaculata* Jac. with four small basal spots and a large apical spot but with a pale undersurface and pale femora; and *L. variabilis* Jac. which has two basal spots and two apical spots. The second species also has quite differently colored legs.

Pseudoepitrix hottensis n. sp.

Fig. 4

About 2.5 mm. in length, elongate, shining reddish brown, outer joints of antennæ and undersurface deeper brown in color; pronotum densely and rather coarsely punctate.

Head with interocular space half its width, occiput rounded, not very shiny but finely alutaceous, a circle of fine punctures in front and over the indistinct tubercles, a sulcus running from antennal sockets up to eye; antennal sockets situated about midway down front of head, lower front tapering. Antennæ extending to the middle of the elytra, third joint shorter than fourth, last five joints darker. Prothorax not twice as wide as long with only slightly curved and nearly straight sides, having a prominent anterior angle under eye; a well marked and somewhat sinuate basal depression; surface finely alutaceous, somewhat shiny, moderately coarsely and densely punctate. Elytra with the striate punctures coarser in basal half, becoming fine at apex, basal callosities well marked and a transverse impression below them. Body beneath deeper brown, shining, lightly pubescent, legs yellow brown, tibiæ not sulcate, first tarsal joint not so long as the remaining joints together, claws appendiculate. Length 2.5 mm.; width 1.2 mm.

Type male M.C.Z. Type No. 27801.

Type locality.—Desbarriere, Mt. LaHotte, Haiti, about 4000 ft. elevation, collected Oct. 12–14, 1934, by P. J. Darlington.

Remarks.—This is the second species to be described from Hispaniola. *P. hispaniolæ* Blake, described from the Dominican Republic, is more robust with a much more densely and coarsely punctate pronotum, and has a differently shaped ædeagus.

Pseudoepitrix punctatissima n. sp.

Fig. 7

About 2 mm. in length, elongate oblong, moderately convex, shining, very dark reddish brown, almost piceous, with densely and coarsely punctate pronotum and elytra; legs and antennal joints 3–6 and 10 and 11 pale.

Head with interocular space fully half its width; occiput rounded, distinctly punctate, a deeply impressed line straight across front over frontal tubercles joining with a sulcus about inner and upper side of eye; frontal tubercles somewhat elevated; space between antennal sockets narrow, and lower front to labrum short, labrum long and paler in color. Antennæ not reaching the middle of the elytra, joints 3–6 and 10 and 11 pale, outer joints heavier. Prothorax not twice as wide as long, rather convex, with prominent anterior angle under eye and tooth at basal angle, basal margin a little sinuate, a shallow depression along base; anterior margin a little paler reddish brown; surface shining, densely, deeply and coarsely punctate. Elytra with rounded basal callosity and depression below, convex, very shining dark reddish brown, coarsely striate punctate, the punctures near the suture dense and a little confused and at apex becoming fine, on sides next to margin deeply impressed. Epipleura not reaching apical angle. Body beneath shining deep reddish brown, with paler legs. Anterior coxal cavities open, hind tibiæ not grooved, claws appendiculate. Length 2 mm.; width 1 mm.

Type female M.C.Z. Type No. 27802.

Type locality.—Desbarriere, Mt. LaHotte, about 4000 feet elevation, Haiti, collected Oct. 12–14, 1934, by P. J. Darlington.

Remarks.—This species is more convex than the other species of *Pseudoepitrix* from the West Indies, and it has short antennæ and much coarser punctation, which near the suture of the elytra is confused. It may possibly belong to a different genus.

Aphthona fraterna n. sp.

Fig. 6

About 2 mm. in length, ovate, shining reddish brown with yellow antennæ having joints 6–9 black; elytra very finely striate punctate.

Head with interocular space a little more than half its width, smoothly rounded over occiput, frontal tubercles indistinct, a narrow carina from between antennal sockets down to labrum, a lightly impressed line on either side of forehead running up from short sulcus near eye. Antennæ scarcely reaching the middle of the elytra, joints 3 and 4 subequal and shorter than 5, joints 6–9 black. Prothorax not twice as wide as long with obliquely cut anterior angles, only slightly curved, nearly straight sides, and basal margin forming an oblique angle near sides, disk polished, impunctate. Elytra polished, convex, without depressions, with faintly striate punctation becoming indistinct at apex. Body beneath shining reddish brown, anterior coxal cavities open, hind tibiæ sulcate, with a small spur at apex; claws simple. Length 1.8 mm.; width 1.2 mm.

Type female, M.C.Z. Type No. 27803.

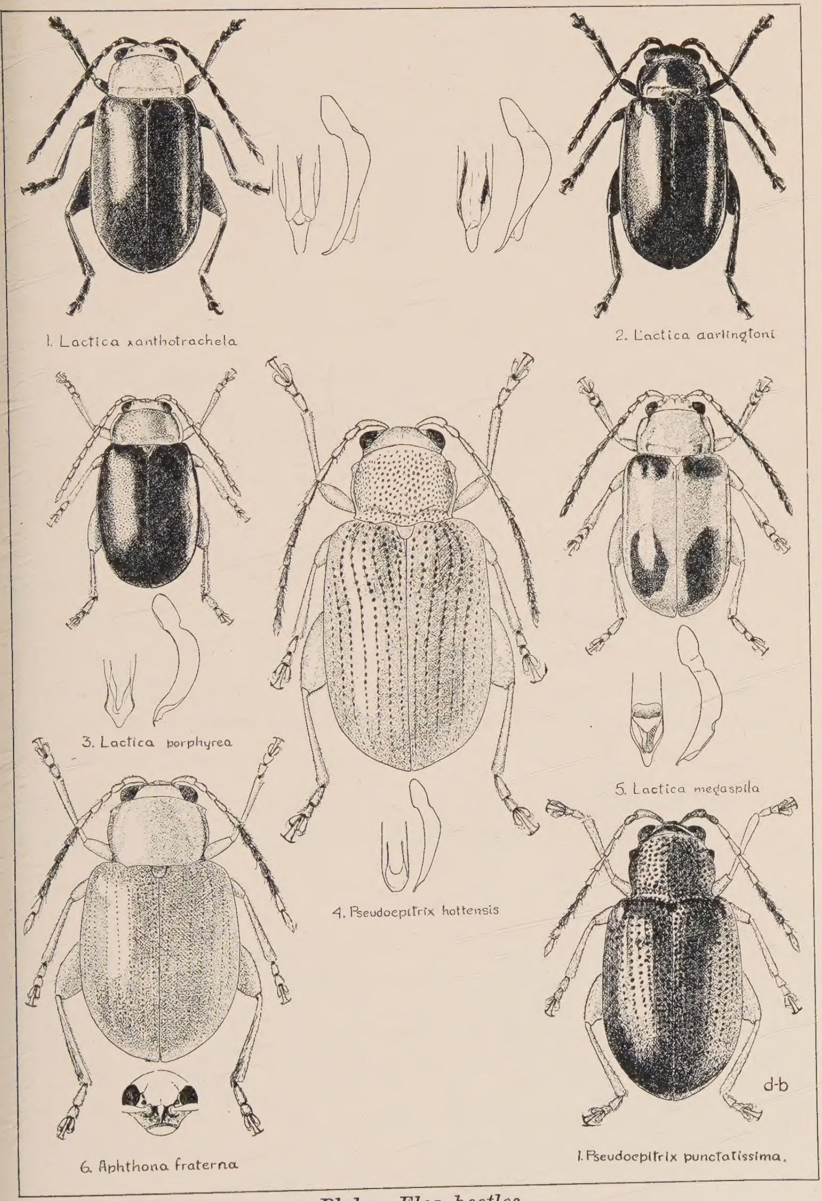
Type locality.—Desbarriere, Mt. LaHotte, Haiti, near 4000 ft., collected Oct. 12–14, 1934, by P. J. Darlington.

Remarks.—This species is closely related to *A. insolita* Melsh. from North America and *A. fulvipennis* Jac. from Guatemala. All three are reddish brown beetles having the antennæ pale with the outer joints in part dark. All have very lightly striate-punctate elytra. *A. fulvipennis* from its description appears to resemble *A. insolita* in the sculpture of the head in that the frontal tubercles are elevated. In *A. fraterna* the tubercles are not even distinctly marked and the lower front is excavated with only a very narrow ridge running down the front between the antennal sockets. *A. insolita* has a quite different face, particularly in the lower front. It has also very fine punctures on the pronotum, the antennæ are heavier and the entire beetle is more convex than *A. fraterna*.

EXPLANATION OF PLATE 14

Fig. 1. *Lactica xanthotrachela,* n. sp.
Fig. 2. *Lactica darlingtoni,* n. sp.
Fig. 3. *Lactica porphyrea,* n. sp.
Fig. 4. *Pseudoepitrix hottensis,* n. sp.
Fig. 5. *Lactica megaspila,* n. sp.
Fig. 6. *Aphthona fraterna,* n. sp.
Fig. 7. *Pseudoepitrix punctatissima,* n. sp.

PSYCHE, 1948 VOL. 55, PLATE 14



Blake—Flea beetles

CAMBRIDGE ENTOMOLOGICAL CLUB

A regular meeting of the Club is held on the second Tuesday of each month (July, August and September, excepted) at 8:00 p.m. in Room B–455, Biological Laboratories, Divinity Ave., Cambridge. Entomologists visiting Boston are cordially invited to attend.

FOR SALE

The Librarian of the Museum of Comparative Zoology is offering for sale a limited number of sets of the "CONTRIBUTIONS FROM THE ENTOMOLOGICAL LABORATORY OF THE BUSSEY INSTITUTION." These are priced at $15.00 f.o.b., Cambridge, Massachusetts.

Each set includes reprints of 292 entomological papers which appeared in various entomological and zoological journals published during the period from 1909 to 1929. These form seven large volumes each substantially bound in red buckram, and a number of additional reprints to form an eighth volume. Altogether there are more than 5800 pages included. Shipping weight is approximately 50 pounds.

Orders should be addressed to Assistant Librarian, Museum of Comparative Zoology, Harvard University, Cambridge, Mass.

The Cambridge Entomological Club has for sale reprints of articles published in PSYCHE between 1910 and 1920. A list of articles available can be obtained from the Editorial Office of PSYCHE, Biological Laboratories, Divinity Ave., Cambridge, Mass.

BACK VOLUMES OF PSYCHE

The Cambridge Entomological Club is able to offer for sale the following volumes of Psyche. Those not mentioned are entirely out of print.

Volumes 2, 3, 4, 5, 6, 7, 8, 9, each covering a period of three years, $5.00 each.

Volumes 10, 12, 14, 17, each covering a single year, $1.00 each.

Volumes 18, 19, 20, 21, 22, 23, 24, 25, 26, each covering a single year, $1.50 each.

Volumes 27 to 53, each covering a single year, $2.00.

Volume 54, covering a single year, $3.00.

Orders for 2 or more volumes subject to a discount of 10%.

Orders for 10 or more volumes subject to a discount of 20%.

All orders should be addressed to

F. M. Carpenter, Editor of Psyche,
Biological Laboratories,
Harvard University,
Cambridge, Mass.